

UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

PATENT NO. : 6,940,875 B2  
APPLICATION NO. : 10/643792  
DATED : September 6, 2005  
INVENTOR(S) : Mesecher et al.

Page 1 of 8

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Delete the title page and substitute therefor the attached title page.  
**ON THE TITLE PAGE**

At Item (57), line 1, before the word "for", delete "reciever" and insert therefor  
--receiver--.

**IN THE DRAWINGS**

Please replace Figures 2-5 and 11 with replacement Figures 2-5 and 11 attached hereto.

**IN THE SPECIFICATION**

At column 2, line 13, after the word "a", delete "B-CDMATM" and insert therefor --B-CDMA<sup>TM</sup>--.

At column 2, line 40, after the word "present", delete "inventor" and insert therefor --invention--.

At column 5, line 53, after the word "mixer", delete "122" and insert therefor --110--.

At column 5, line 67, equation 2, delete " $m = \sqrt{I^2 + Q^2}$ " and insert therefor  
--  $m = \sqrt{I^2 + Q^2}$  --.

At column 9, line 55, after the word "The", delete "anaysis" and insert therefor  
--analysis--.

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Page 2 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

**IN THE CLAIMS**

In claim 24, at column 12, line 42, after the word "response", insert --to--.

[REDACTED]

[REDACTED]

[REDACTED]



US006940875B2

(12) **United States Patent**  
Mesecher et al.

(10) Patent No.: **US 6,940,875 B2**  
(45) Date of Patent: **\*Sep. 6, 2005**

(54) **CONTINUOUSLY ADJUSTED-BANDWIDTH  
DISCRETE-TIME PHASE-LOCKED LOOP**

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(73) Assignee: **InterDigital Technology Corporation**, Wilmington, DE (US)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **10/643,792**

(22) Filed: **Aug. 19, 2003**

(65) **Prior Publication Data**

US 2004/0032842 A1 Feb. 19, 2004

#### Related U.S. Application Data

(63) Continuation of application No. 09/558,686, filed on Apr. 24, 2000, now Pat. No. 6,608,826, which is a continuation of application No. 08/871,109, filed on Jun. 9, 1997, now Pat. No. 6,055,231.

(60) Provisional application No. 60/037,914, filed on Mar. 12, 1997.

(51) Int. Cl.<sup>7</sup> ..... **H04J 3/06**

(52) U.S. Cl. .... **370/516; 370/252; 370/342; 375/136; 375/294**

(58) Field of Search ..... **370/252, 328, 370/329, 335, 342, 441, 463, 516, 330, 320; 375/136, 147, 294, 344, 206, 200, 150, 222; 379/406.08**

(56) **References Cited**

#### U.S. PATENT DOCUMENTS

3,983,501 A	9/1976	Lindstrum	329/307
4,243,941 A	1/1981	Zdunek	329/309
4,354,277 A	10/1982	Crackel et al.	455/259
4,513,429 A	4/1985	Roeder	375/376
4,630,283 A	12/1986	Schiff	375/143
5,029,180 A	7/1991	Cowart	375/141
5,049,830 A	9/1991	Yoshida	329/306
5,065,107 A	11/1991	Kumar et al.	329/308
5,101,416 A	3/1992	Fenton et al.	375/150
5,142,246 A	8/1992	Petersson	331/11
5,166,952 A	11/1992	Omura et al.	375/149
5,175,729 A	12/1992	Borras et al.	370/345

(Continued)

#### FOREIGN PATENT DOCUMENTS

WO 9620540 7/1996

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(74) Attorney, Agent, or Firm—Volpe and Koenig, P.C.

(57) **ABSTRACT**

A receiver for receiving a CDMA communication signal that is wirelessly transmitted includes a system for correcting phase errors in an information signal which has been transmitted. The correction system comprises circuitry for generating a mixing signal and for combining the mixing signal with said information signal to produce a correction signal. An analyzer analyzes the phase of said correction signal and generates an error signal based on the deviation of the analyzed phase from a reference phase. A bandwidth controller which recursively adjusts the phase of the correction signal such that the phase of said correction signal is substantially equal to said reference phase. The bandwidth controller then selects a bandwidth within an adjustable range based on the correction signal, estimates an offset by interrogating the error signal, and modifies said correction signal by the offset.

**25 Claims, 14 Drawing Sheets**

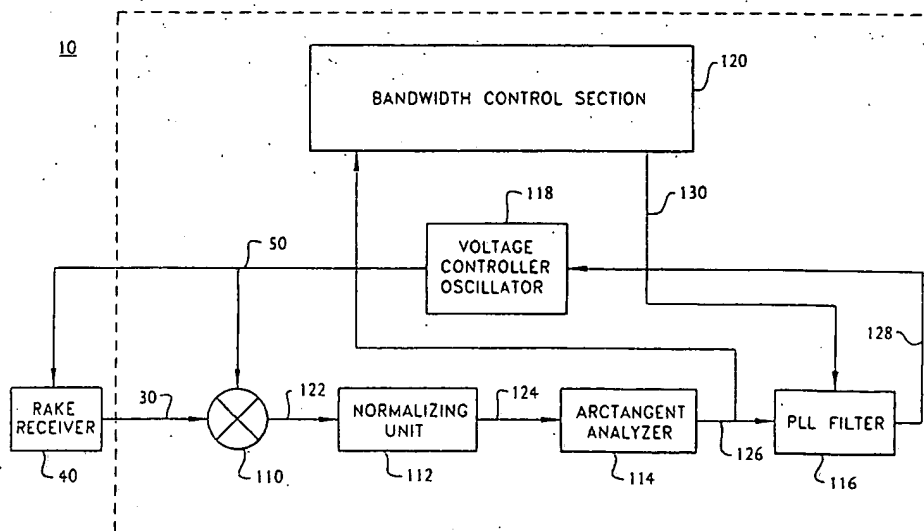


FIG. 2

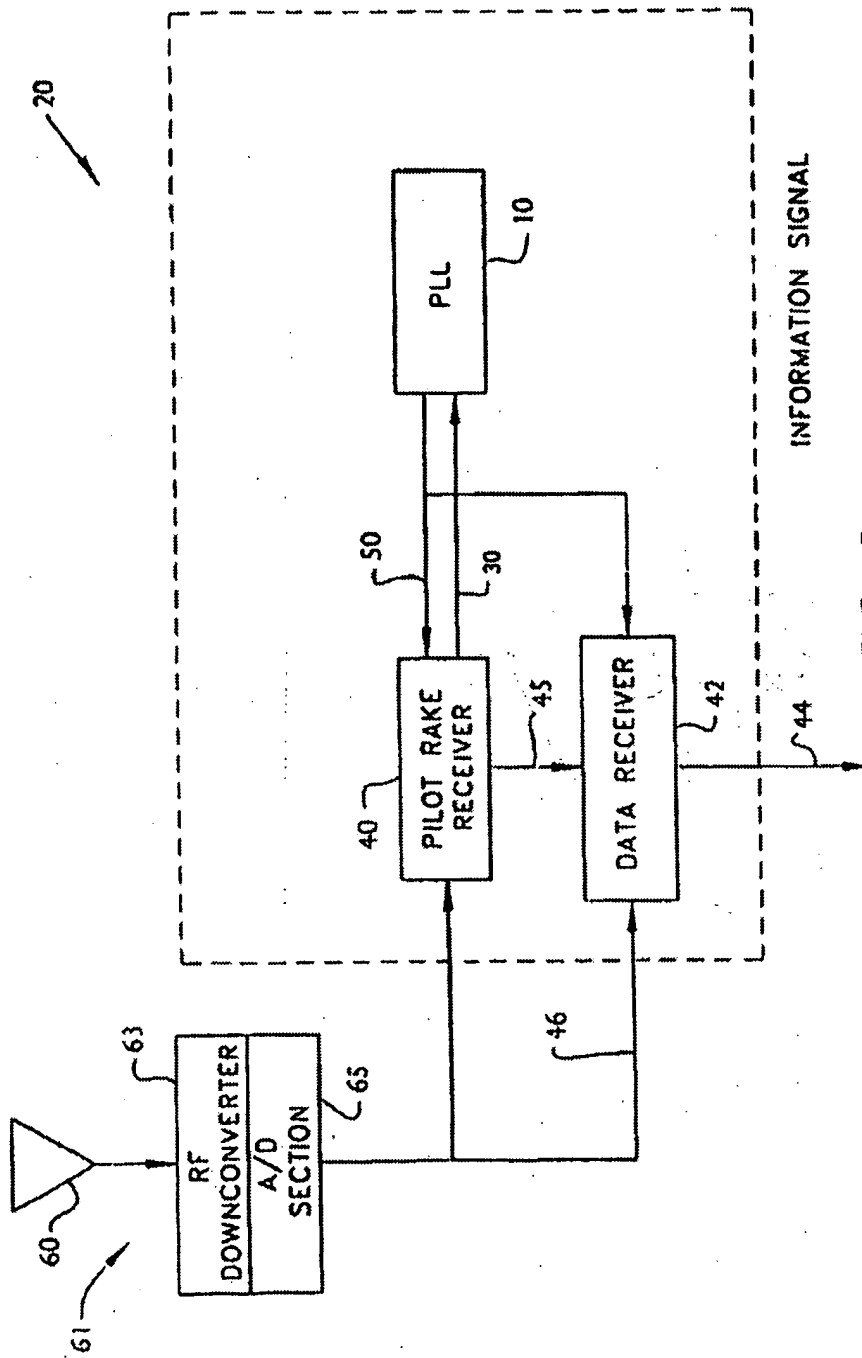
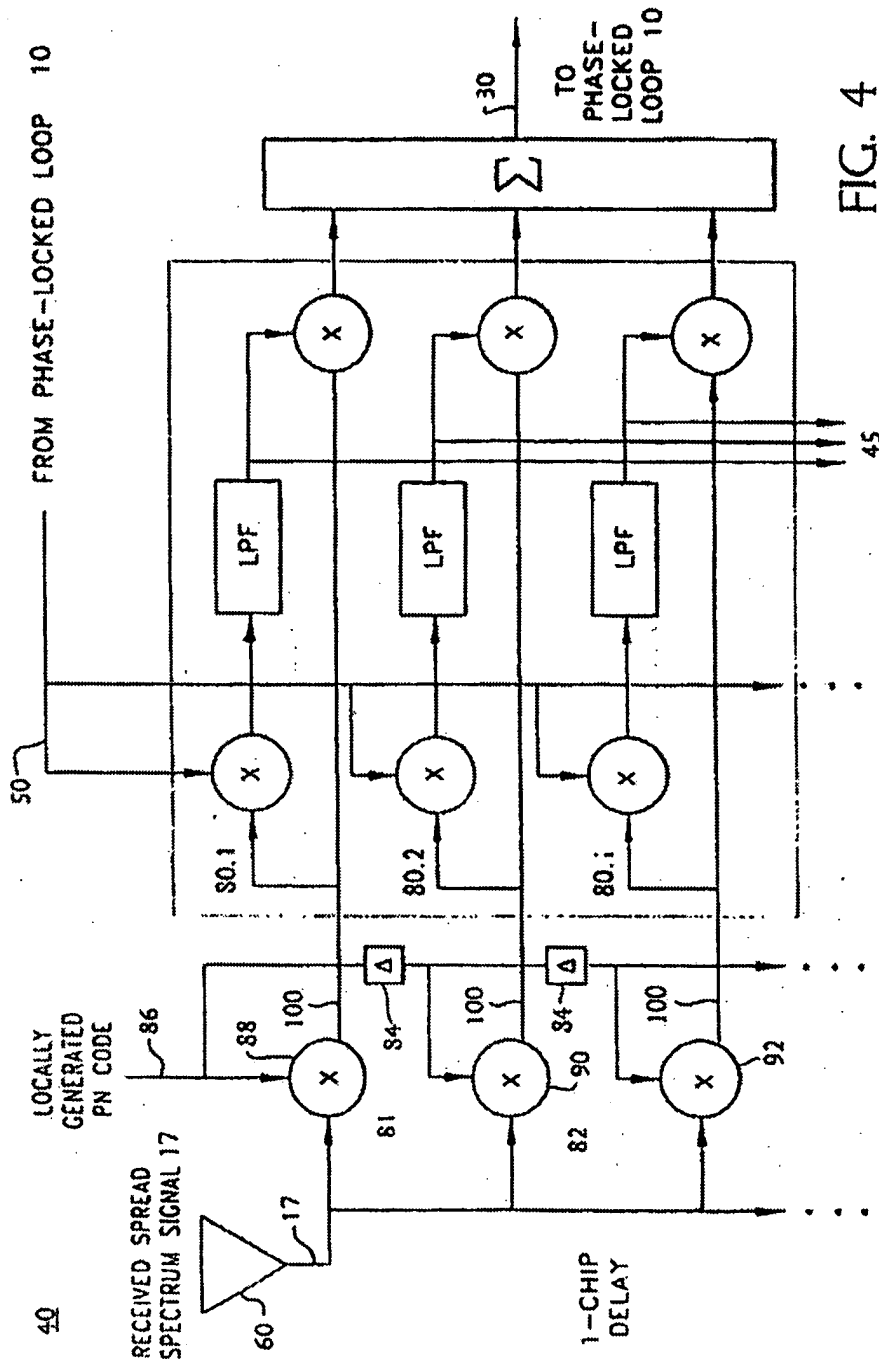


FIG. 3



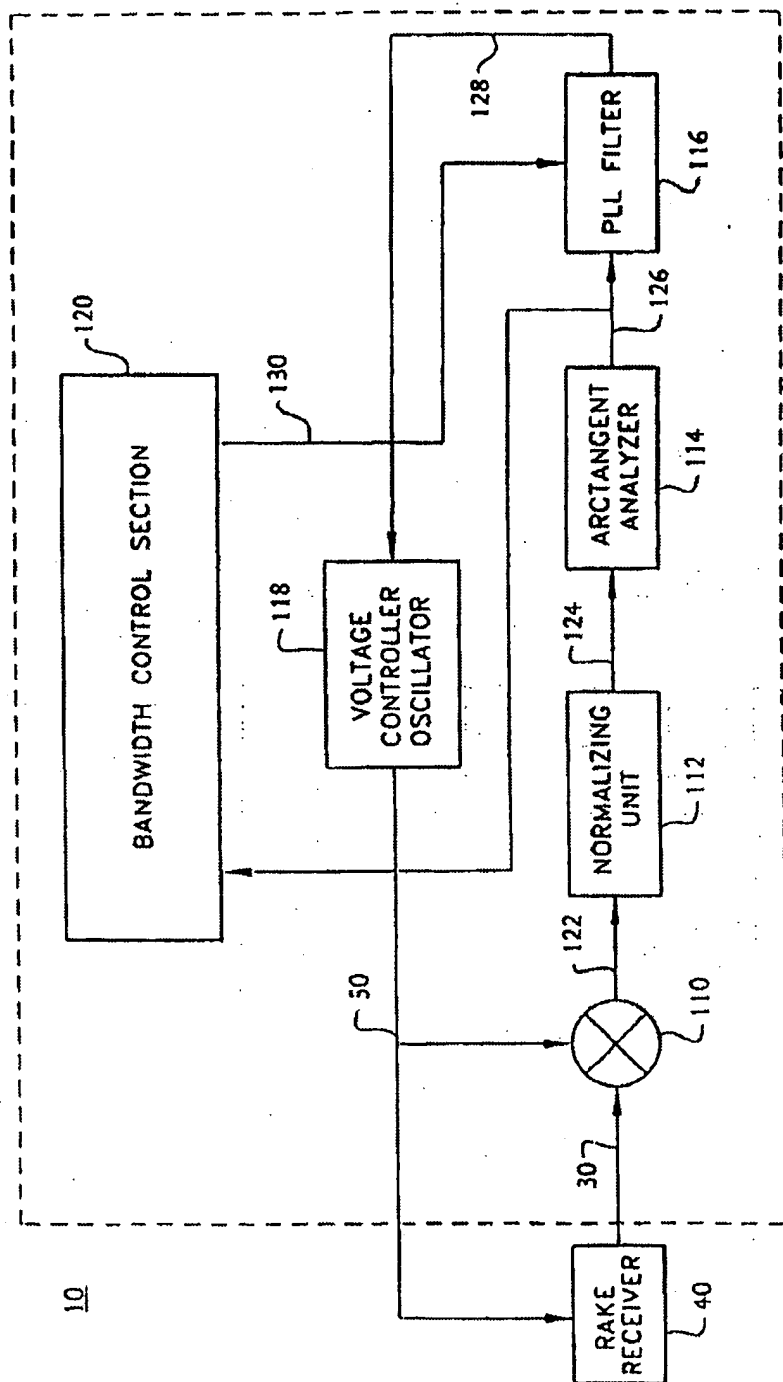


FIG. 5

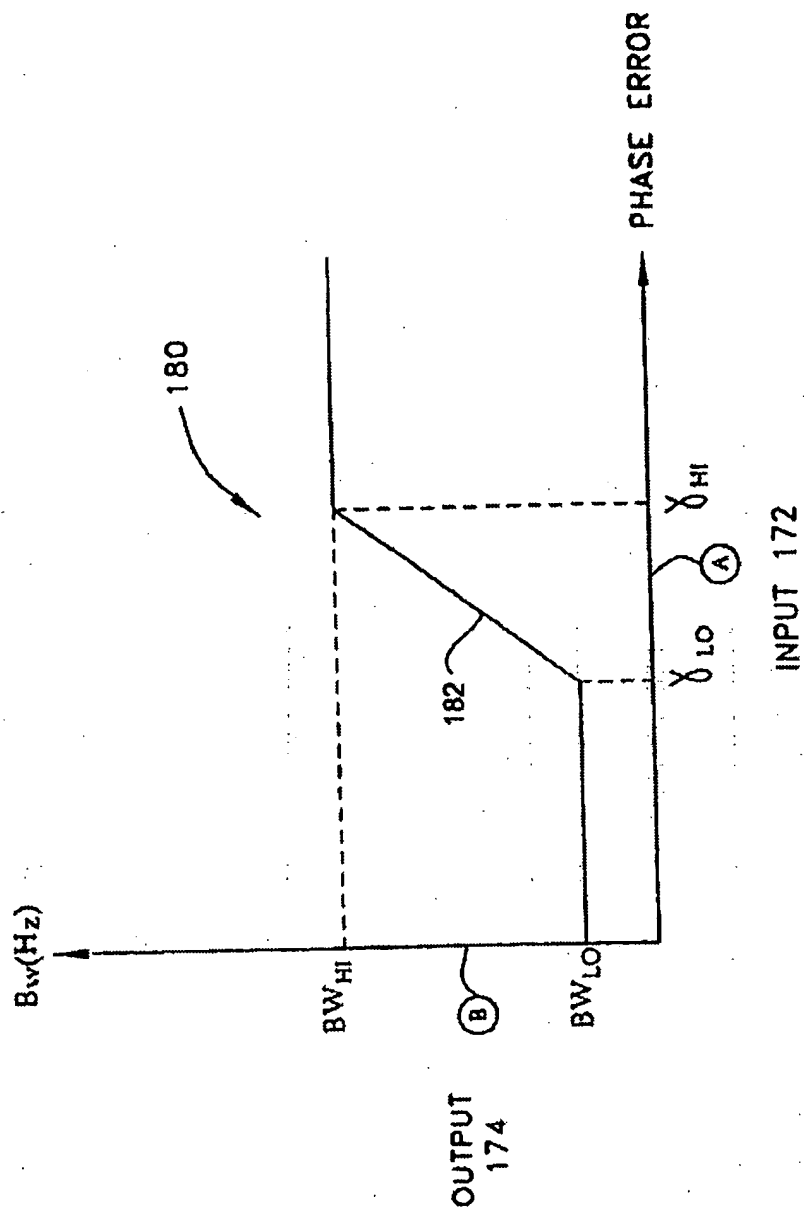


FIG. 11